

METHOD FOR FORMING MICROELECTRONIC SPRING STRUCTURES ON A SUBSTRATE

ABSTRACT OF THE DISCLOSURE

A method for fabricating microelectronic spring structures is disclosed. In an
5 initial step of the method, a layer of sacrificial material is formed over a substrate. Then,
a contoured surface is developed in the sacrificial material, such as by molding the
sacrificial material using a mold or stamp. The contoured surface provides a mold for at
least one spring form, and preferably for an array of spring forms. If necessary, the
sacrificial layer is then cured or hardened. A layer of spring material is deposited over
10 the contoured surface of the sacrificial material, in a pattern to define at least one spring
form, and preferably an array of spring forms. The sacrificial material is then at least
partially removed from beneath the spring form to reveal at least one freestanding
spring structure. A separate conducting tip is optionally attached to each resulting
spring structure, and each structure is optionally plated or covered with an additional
15 layer or layers of material, as desired. An alternative method for making a resilient
contact structure using the properties of a fluid meniscus is additionally disclosed. In an
initial step of the alternative method, a layer of material is provided over a substrate.
Then, a recess is developed in the material, and fluid is provided in the recess to form a
meniscus. The fluid is cured or hardened to stabilize the contoured shape of the
20 meniscus. The stabilized meniscus is then used to define a spring form in the same
manner as the molded surface in the sacrificial material.